FAST POSITIONING OF DISK DRIVES AND OTHER PHYSICAL SYSTEMS

Abstract of the Disclosure

A method useful to change a system's output from one value to another within a prescribed time-interval in an optimal manner using optimization criteria such as minimal time (e.g., to increase throughput) or minimal energy (e.g., to reduce heat dissipation and reduce induced vibrations). Optimal design of maneuvers (such as fast seek and scanning) that rapidly change the output from one value to another, arise in flexible structure applications, including rapidly positioning the end-point of large-scale space manipulators, positioning of read/write heads of disk-drive servo systems, which are relatively medium-scale flexible structures, and nano-scale positioning and manipulation using relatively small-scale piezo actuators. Maintaining a position of an element constant outside of the transition time-interval is critical in many applications. For example, in disk-drive applications, read and write operations cannot be performed (before and after the output transition) if the output position is not precisely maintained at a desired track.